

Temperature and rainfall data for the cotton districts, May, 1886.

Districts.	Rainfall.			Temperature.								Extremes for May, 1886.	
	Average for May of four preceding years.	Average for May, 1886.	Departures.	Maximum.			Minimum.						
				Mean for May of four pre- ceding years.	Mean for May, 1886.	Departures.	Mean for May of four pre- ceding years.	Mean for May, 1886.	Departures.				
										Max.	Min.		
New Orleans...	Inch. 5.46	Inch. 1.11	Inch. - 4.35	° 83.7	° 86.6	+ 2.9	° 62.6	° 65.2	+ 2.6	° 104	° 47		
Savannah...	5.12	2.89	- 0.23	85.5	85.8	+ 0.3	62.0	62.8	+ 0.8	99	44		
Charleston...	3.46	1.98	- 1.48	83.2	84.9	+ 1.7	59.5	58.9	- 0.6	98	40		
Atlanta...	3.02	5.95	+ 2.93	81.0	81.8	+ 0.8	56.4	58.3	+ 1.9	98	41		
Wilmington...	3.71	4.94	+ 1.23	79.2	83.1	+ 3.9	56.1	59.0	+ 2.9	98	40		
Memphis...	4.69	3.49	- 1.20	83.8	82.4	- 1.4	56.4	57.7	+ 1.3	97	30		
Galveston...	6.53	0.26	- 6.27	83.8	87.9	+ 4.1	62.2	64.7	+ 2.5	101	48		
Vicksburg...	5.79	1.87	- 3.92	82.0	84.7	+ 2.7	60.3	62.0	+ 1.7	97	41		
Montgomery...	3.23	3.36	+ 0.13	83.5	84.4	+ 0.9	58.7	59.3	+ 0.6	97	39		
Augusta...	3.17	5.42	+ 2.25	83.3	84.1	+ 0.8	58.8	60.1	+ 1.3	97	42		
Little Rock...	5.85	0.80	- 5.05	79.8	85.5	+ 5.7	65.3	66.0	+ 0.7	99	41		
Mobile...	3.96	2.47	- 1.49	83.3	85.1	+ 1.8	60.1	58.8	- 1.3	99	43		

TEMPERATURE OF WATER.

The following table shows the highest and lowest temperatures of water observed at the several stations; the monthly ranges of water temperature; the average depth at which the observations were made; and the mean temperature of the air:

Temperature of water for May, 1886.

Station.	Temperature at bottom.		Range.	Average depth, feet and tenths.	Mean temperature of the air at station.
	Max.	Min.			
Atlantic City, New Jersey.....	59.1	48.8	9.3	10.2	57.0
Alpena, Michigan.....	60.7	48.8	11.9	12.7	49.6
Augusta, Georgia.....	78.2	65.0	13.2	12.4	72.2
Baltimore, Maryland.....	66.3	52.6	13.7	11.0	61.9
Block Island, Rhode Island.....	55.2	46.2	9.0	8.5	53.5
Boston, Massachusetts.....	57.7	52.0	5.7	19.6	56.2
Buffalo, New York.....	57.4	46.6	10.8	10.1	53.1
Canby, Fort, Washington Territory.....	59.0	50.4	8.6	16.1	52.1
Cedar Keys, Florida.....	79.9	73.7	6.2	8.2	74.0
Charleston, South Carolina.....	77.5	67.6	9.9	38.2	72.8
Chicago, Illinois.....	64.4	46.0	18.4	8.5	57.0
Chincoteague, Virginia.....	71.5	53.9	17.6	3.0	59.6
Cleveland, Ohio.....	63.4	48.3	15.1	14.0	57.4
Detroit, Michigan.....	58.1	46.8	11.3	26.9	58.4
Duluth, Minnesota.....	39.9	36.1	3.8	10.9	52.2
Eastport, Maine.....	43.0	38.4	4.6	16.2	47.0
Escanaba, Michigan.....	56.9	42.0	14.9	18.4	50.0
Galveston, Texas.....	84.6	70.0	14.6	12.9	74.6
Grand Haven, Michigan.....	68.6	58.5	10.1	19.0	52.3
Indianola, Texas.....					
Jacksonville, Florida.....	82.7	74.5	8.2	18.0	75.8
Key West, Florida.....	86.5	76.5	10.0	17.6	78.9
Mackinaw City, Michigan.....	50.1	39.0	11.1	10.0	49.9
Macon, Fort, North Carolina.....	70.0	59.0	11.0	11.1	68.1
Marquette, Michigan.....	54.1	37.5	16.6	11.6	49.4
Milwaukee, Wisconsin.....	58.0	40.5	17.5	8.0	54.3
Mobile, Alabama.....	79.0	67.7	11.3	17.6	72.2
New Haven, Connecticut.....	61.0	51.0	10.0	16.8	56.6
New London, Connecticut.....	66.6	45.6	21.0	13.0	56.8
New York City.....	60.0	53.0	7.0	17.0	58.5
Norfolk, Virginia.....	71.2	56.0	15.2	16.4	65.0
Pensacola, Florida.....	76.9	69.1	7.8	17.5	73.8
Portland, Maine.....	52.7	43.3	9.4	16.2	53.1
Portland, Oregon.....	64.6	52.4	12.2	52.9	57.7
Sandusky, Ohio.....	69.2	57.4	11.8	11.3	59.5
Sandy Hook, New Jersey.....	64.3	50.0	14.3	11.8	57.9
San Francisco, California.....	62.3	56.5	5.8	37.3	57.8
Savannah, Georgia.....	77.2	68.0	9.2	10.0	75.0
Smithville, North Carolina.....	78.1	63.1	15.0	11.0	70.2
Toledo, Ohio.....	72.2	60.1	12.1	13.3	52.7
Wilmington, North Carolina.....	74.5	64.9	9.6	10.0	70.2

* Record for 30 days; lake too rough to take observation on the 7th. † Frozen first four days of month. Observations interrupted by ice in bay 7th to 10th, 12th, 13th, 15th, 20th, 21st. ‡ Observations temporarily suspended. § Record for the first 20 days.

WINDS.

The most frequent directions of the wind during May, 1886, are shown on chart ii by the arrows flying with the wind; they are also given in the tables of miscellaneous meteorological data. In the lower lake region, the south Atlantic and east Gulf states, the prevailing direction of the wind is from the southwest, in the west Gulf states and Texas it is from the south and southeast. In the Extreme Northwest and the Upper Mississippi Valley the winds are generally from the north and northwest; in other districts they are variable.

HIGH WINDS.

[In miles per hour.]

Wind-velocities of fifty or more miles per hour were reported during the month as follows:

Mount Washington, New Hampshire, 59, nw., 4th; 80, w., 5th; 54, w., 9th; 60, w., 10th; 58, se. and e., 11th; 50, w., 12th; 82, s., 15th; 88, s., 16th; 62, nw., 17th; 54, nw., 19th; 78, nw., 20th; 62, nw., 21st; 70, w., 22d; 54, w., 23d; 70, w., 25th; 80, nw., 26th; 58, nw., 27th; 50, nw., 28th; 60, nw., 29th; 58, nw., 30th.

Pike's Peak, Colorado, 60, w., 1st; 60, sw., 3d; 74, w., 5th; 68, w., 8th; 66, w., 9th; 56, w., 10th; 72, sw., 13th; 52, w., 31st.

Valentine, Nebraska, 54, e., 9th.

Kitty Hawk, North Carolina, 56, n., 1st.

Cape Henry, Virginia, 60, nw., 1st; 54, n., 2d.

Chincoteague, Virginia, 50, ne., 1st.

LOCAL STORMS AND TORNADOES.

La Plata, Macon county, Missouri: a heavy wind storm prevailed here on the night of the 4-5th. Orchards, fences, and small houses were leveled to the ground, and cattle killed. Owing to the violence of the storm many persons sought refuge in cellars.

Woodstock, McHenry county, Illinois: the portion of country lying between the towns of Ringwood and McHenry, in this county, was visited on the 6th by a tornado, which was very disastrous to farmers in the small area over which it passed. At noon the atmosphere was clear and warm, temperature rising until about 2 p. m., when the sky to the north became overcast with heavy black clouds; the sultry air suddenly began to get very cool, the mercury falling several degrees in a few minutes. The northern clouds grew blacker and moved southward, and the lull which had followed the first cool breeze was suddenly broken by the roar of the tornado. Trees bent before the blast like grain, and the smaller ones were snapped in pieces or twisted from the earth by the roots. The air was filled with flying limbs, pieces of boards, and other objects. Two men were killed, and several persons injured.

Oskaloosa, Mahaska county, Iowa: on the 9th, a violent wind storm did considerable damage to property; houses were unroofed, trees and fences blown down, and the amphitheatre in the fair grounds was wrecked.

Pittsburg, Pennsylvania: reports from points along the Conemaugh Valley, in Indiana county, indicate the occurrence of a tornado in that section on the evening of the 10th. Several persons were seriously injured. Descriptions of this tornado say that telegraph poles along the railroad were blown down, cows were killed and trees were blown fully two hundred feet in the air, while many fences and small buildings were destroyed.

McConnellsburg, Indiana county, Pennsylvania: the Methodist Episcopal church was struck by lightning during the evening of the 10th and considerably damaged. Two men engaged in burning lime were prostrated by a bolt of lightning and two horses killed.

Blairsville, Indiana county, Pennsylvania: a heavy hail storm passed over this place about 6 p. m. of the 10th, and was followed by a tornado which swept from Salina along the valley of the Conemaugh River to Coketown, cutting down trees and destroying numerous outhouses and barns. It caused the water in the river to rise to the height of seventy-five feet, in the form of an inverted water-spout, which revolved about a moving centre, travelling across and up the stream until it reached the new Coketown bridge, an iron structure five hundred and twenty feet long, which was damaged to the extent of \$5,000. The tornado left the river at this point and continued across the country, blowing down telegraph poles, trees, smoke-stacks, and barns. Near Conemaugh a number of freight cars were standing on a siding; the tornado lifted them bodily from the track and dashed them to the ground.

Kansas City, Missouri: a very disastrous tornado occurred at

this place on the afternoon of the 11th. The approach of the storm was preceded by the appearance of a very dark cloud in the southwestern sky, which moved rapidly toward the city, and suddenly spread over the entire sky, enveloping the city with the darkness of night. During this darkness the people were much alarmed and business was suspended. The Lathrop school building was almost destroyed, the entire upper portion of the structure being blown in. The heavy masonry and timbers fell through the third and second floors, killing fifteen children and wounding many more. A factory in which a number of persons were at work was destroyed, killing and injuring several persons. The court-house, as well as many other buildings, was wrecked. The tornado was accompanied by very heavy rain, being described by witnesses as "cloud bursts," which fell in torrents for three-quarters of an hour.

Odell, Livingston county, Illinois: a tornado occurred here on the night of the 11th. In a few seconds after the storm first reached the town several large stores and a hotel were unroofed; one large brick building was nearly destroyed, filling the air with debris. All the telegraph wires in the vicinity were down.

Rockford, Winnebago county, Illinois: at 5.30 p. m. of the 11th heavy roaring clouds from the south and east met over Rockford, producing a destructive thunder-storm.

Attica, Fountain county, Indiana: a tornado occurred at Attica on the 12th at 6.10 p. m. In five minutes two hundred houses were destroyed, among which were the Revere House and the Chicago and Great Southern freight depot. Many business houses and residences were in ruins, and twelve persons were injured. The afternoon was oppressively warm. At the hour named above black clouds west of the town approached each other from north and south and formed a junction apparently about half a mile west of and opposite the centre of the town, when it rapidly approached. The path of the storm, which was traced by the wreck of buildings, was from one to two hundred yards wide, and extended towards the northeast.

Albany, Tuscarawas county, Ohio: a tornado passed through Columbia township, Meigs county, five miles from this place, on the 12th, between 10 p. m. and midnight. Its track was from one-fourth to one-half mile wide. Considerable property was destroyed and several persons killed or injured.

Athens, Athens county, Ohio: near Carpenter's Station, in the southern part of this county, two persons were instantly killed and several injured by a tornado on the 12th. The storm was attended with serious and widespread damage to farm property and bridges throughout the county. The rainfall was very heavy, and all streams were swollen.

Richmond, Wayne county, Indiana: a tornado passed over the southeastern portion of this county on the 12th doing great damage. Many farm houses and barns were blown down. The track of the cyclone was about half a mile wide, and the woods in its track were entirely leveled. No lives were lost, but several persons were injured. At Richmond the rain was reported to have been the heaviest ever known, although not accompanied by winds. About eighty feet of the Pan-Handle track, east of the town, was swept away by the bursting of the dam at Glen Miller.

Miamisburg, Montgomery county, Ohio, was visited by a severe gale and rain storm, which was attended by heavy thunder and incessant lightning, on the night of the 12-13th. The path of greatest severity is reported to have been about thirteen miles wide. In some places the storm was attended by the characteristics of a tornado. Forests were prostrated in great masses; farm houses, sheds, barns, schools, and churches wrecked, and hundreds of bridges swept from the pikes, country roads, and railways.

Frankfort, Kentucky: on the 13th a severe thunder-storm, attended by high wind and heavy hail, occurred. Considerable damage was inflicted upon trees, gardens, and houses.

Jacksonville, Morgan county, Illinois: a tornado devastated

a section of country north of this place on the night of the 13-14th. Many farm-houses were wrecked and orchards blown down. The loss was estimated at \$15,000.

Portland, Indiana: a tornado passed two miles north of this place on the 14th, at 8 p. m. Houses, fences, and trees were thrown down. Several persons were killed and wounded.

Topeka, Shawnee county, Kansas: a destructive tornado passed across the northern part of this county on the 14th, and damaged a portion of the town of Meriden. About 10 o'clock in the morning a very black cloud came up suddenly from the southeast, and sweeping through the eastern portion of the town, destroyed a number of buildings and injured several persons.

Lansing, Michigan: a tornado formed at a point about one mile north of Lansing on the night of the 14-15th, and moved in a northerly direction, leveling fences, forests, and buildings. When the black, funnel-shaped cloud was first noticed it seemed to be motionless for a few seconds and then moved slowly toward the north, with the tube of the funnel touching the ground. It cut a swath one-quarter of a mile wide through forests and orchards; but little property was destroyed as the tornado passed through a section of country which was but thinly settled.

Cincinnati, Ohio: a tornado passed over Mercer county on the night of the 14-15th. Shortly after 9 p. m. of the 14th huge black clouds appeared in the northwest, the atmosphere appeared to be heavily charged with electricity, heavy peals of thunder and vivid flashes of lightning, accompanied by an unusually warm and stagnant atmosphere, caused considerable alarm and uneasiness. The tornado developed about 10 p. m., and swept through the entire western section of this county. It was confined to a belt not more than a quarter of a mile wide, but within this area everything was leveled to the earth—houses and buildings of all descriptions were wrecked and scattered over miles of territory. Forests were laid low, crops destroyed, fences torn down, and hundreds of families were made homeless. It is reported that more than thirty persons lost their lives and many times that number were wounded. From Mercer the tornado passed into Auglaize county and continued its work of destruction, but the damage was less severe in this county than at other points. Hardin county was next visited by the storm. Previously its path had been through the open country over farms and forests and had met with no towns in its path. Shortly before midnight it arrived at Dunkirk, a town of 1,300 inhabitants, in the northeastern corner of the county. The people were asleep when the tornado came upon them. Its work of destruction was done in less than one minute. Five persons were found dead, and twenty, badly injured, were taken from the wrecks of their dwellings. In Carey, Wyandotte county, seventeen buildings were completely destroyed and six persons killed. Bloomville, South Carey, Wharton, and many other villages suffered from destruction of lives and property. The tornado next passed into Seneca county and, coming as it did, at midnight, after the inhabitants had retired, was more than usually destructive to life. This tornado appears to have originated in Anderson, Indiana, and crossing into Ohio passed in a northeasterly direction through seven counties in that state, terminating in the central portion of Seneca county, forming a path about one hundred and ten miles long, and varying from a quarter to a mile in width. This path was broken at numerous points by portions of country untouched by the storm, which appeared to touch the surface of the country at points and then rise into the air descending again further on. It was accompanied by heavy rain, and much damage resulted from freshets washing away soil and crops.

Milledgeville, Georgia: a very severe thunder-storm occurred here on the 18th, at 6.30 p. m. Two miles south of this place it assumed the proportions of a tornado which came from the southwest. Considerable timber was destroyed and several farm houses were blown down.

Thornville, Lapeer county, Michigan: on the night of the

26-27th, a tornado crossed Lapeer county, moving in a south-west direction from Marathon to Almont and touching the earth every mile or two. The track was nowhere more than eighty rods wide, in some places only ten rods. The limits of its track were very sharply defined. In some cases the débris was carried four miles.

NAVIGATION.

STAGE OF WATER IN RIVERS.

In the following table are shown the danger-points at the various river stations; the highest and lowest depths for May, 1886, with the dates of occurrence, and the monthly ranges:

Heights of rivers above low-water mark, May, 1886.

[Expressed in feet and tenths.]

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Date.	Height.	Date.	Height.	
<i>Red River:</i>						
Shreveport, Louisiana.....	29.9	1	18.0	31	5.2	12.8
<i>Arkansas River:</i>						
Fort Smith, Arkansas.....	22.0	1	9.8	30, 31	3.3	6.5
Little Rock, Arkansas.....	23.0	2	11.5	30, 31	3.6	7.9
<i>Missouri River:</i>						
Yankton, Dakota.....	24.0	15, 16	16.9	7	14.7	2.2
Omaha, Nebraska.....	18.0	6	9.8	26 to 31	8.2	1.6
Leavenworth, Kansas.....	20.0	7	11.9	31	9.2	2.7
<i>Mississippi River:</i>						
Saint Paul, Minnesota.....	14.5	3, 4, 5	8.0	30, 31	4.3	3.7
La Crosse, Wisconsin.....	24.0	1	10.2	31	6.5	3.7
Dubuque, Iowa.....	16.0					
Davenport, Iowa.....	15.0	2	12.7	31	6.5	6.2
Keokuk, Iowa.....	14.0	6	16.0	31	8.1	7.9
Saint Louis, Missouri.....	32.0	13	27.0	31	18.0	9.0
Cairo, Illinois.....	40.0	17, 18	39.8	6	24.7	15.1
Memphis, Tennessee.....	34.0	1	34.6	9	22.8	11.8
Vicksburg, Mississippi.....	41.0	7, 8, 9	44.2	31	41.9	2.3
New Orleans, Louisiana.....	13.0	14, 15, 19, 20, 23, 24, 25, 27 to 31	14.3	1	13.9	0.4
<i>Ohio River:</i>						
Pittsburg, Pennsylvania.....	22.0	15	13.0	31	2.4	10.6
Cincinnati, Ohio.....	50.0	15	37.0	31	12.8	24.2
Louisville, Kentucky.....	25.0	16	14.7	2	6.5	8.2
<i>Cumberland River:</i>						
Nashville, Tennessee.....	40.0	13	28.7	30	5.0	23.7
<i>Tennessee River:</i>						
Chattanooga, Tennessee.....	33.0	12	10.8	19	5.7	5.1
<i>Monongahela River:</i>						
Pittsburg, Pennsylvania.....	29.0	15	13.0	31	2.4	10.6
<i>Savannah River:</i>						
Augusta, Georgia.....	32.0	21	32.5	16	7.7	24.8
<i>Mobile River:</i>						
Mobile, Alabama.....		19	18.7	26	16.8	1.9
<i>Sacramento River:</i>						
Red Bluff, California.....		8	7.0	31	3.2	3.8
Sacramento, California.....		1	23.0	30, 31	21.0	2.0
<i>Willamette River:</i>						
Portland, Oregon.....		31	17.4	7	7.3	10.1
<i>Colorado River:</i>						
Yuma, Arizona.....		31	24.5	4, 5, 6	18.5	6.0

The Mississippi River was at the danger point, or above it, at New Orleans, Louisiana, during the last half of the month; from New Orleans northward the highest stage of water occurred at Vicksburg, Mississippi, on the 7th, 8th, and 9th, and at Memphis, Tennessee, on the 1st.

Owing to the drought which prevailed in the Red River valley the Red River was very low during the entire month, reaching its lowest point on the 31st.

The Ohio River was highest at all points about the middle of the month and lowest on the 31st.

The Missouri River reached its lowest point on the 31st.

ICE IN RIVERS AND HARBORS.

Port Huron, Michigan: small quantities of ice were seen floating down the Saint Clair River on the 1st and 2d.

Duluth, Minnesota: during the night of the 3-4th the wind blew briskly from the northwest, driving the ice from the north shore; heavy rain followed, causing a break in the ice, which was taken advantage of by many boats outside. The steamer "Campana" arrived at noon, being the first arrival of the season.

Fort Benton, Montana: the steamer "Rosebud" arrived from Bismarck on the 15th, being the first vessel of the season to arrive here.

Saint Vincent, Minnesota: the steamer "Pluck" from Fargo, Dakota, arrived on the 28th, being the first boat reaching here since the opening of navigation.

FLOODS.

San Antonio, Texas: a heavy thunder storm occurred at this place during the afternoon of the 2d, 2.30 inches of rain falling in less than two hours. The storm was quite severe in the town, overflowing the irrigating ditches and the San Antonio River, which rose five feet in less than three hours, carrying away fences and destroying vegetable gardens, entailing a loss of \$20,000. Excepting the damage caused by the flood this rain was of great benefit to farmers and stockmen, as very little rain had fallen during the two preceding months.

Lead Hill, Arkansas: reports from Ozark county, Missouri, say: on the night of the 5-6th the Little North Fork Creek, in this county, overflowed its banks, and destroyed considerable farm property. Beaver Creek, in Douglas and Taney counties, Missouri, also overflowed at the same time, and did much damage to farm land.

Springfield, Missouri: a very heavy rainfall prevailed at this place and over the adjacent country during the 5th and 6th, 6.60 inches of rain falling in twenty-seven hours, doing a large amount of damage to property both in town and over the surrounding country. The rain was preceded by hail, which fell to a considerable depth in about fifteen minutes, many of the hailstones being from one-half to two inches in diameter. All the creeks and their branches became much swollen, tearing away fences and inundating bottom lands. Jordan Creek, which runs directly through this city, rose higher than for many years, overflowing the lowland and driving thirty or forty families from their homes. Some of the women and children were carried out on horseback and on men's shoulders to the higher ground to escape drowning, the water in places rising into the second stories of the dwellings. Three of the city's wooden bridges were washed away, and the basements of a number of business houses were filled with water. Some of the smaller dwelling houses were carried from their foundations. A large amount of lumber was lost. Half a mile of the Gulf Railway track, within the city limits, was completely submerged, interrupting the passage of trains. The damage in the city and surrounding country was estimated at \$115,000.

Emporia, Kansas: a heavy fall of rain, which is described by those who saw it as a "waterspout," passed down Jacobs' creek, fourteen miles southwest of this place, on the 6th. Five persons who were traveling in a wagon were overtaken by the flood and the vehicle was swept away, two of its occupants being drowned. The storm between Emporia and Florence was very severe, hailstones of large size falling. An eastern bound passenger train on the Santa Fé railroad had many windows broken by the hail.

Fort Scott, Bourbon county, Kansas: a destructive rain-storm occurred at this place about noon on the 6th. During the storm an ice dam broke and the water, heretofore held back by the dam, uniting with the already swollen stream, rushed down the valley, destroying a house and drowning one of its occupants.

Nevada, Vernon county, Missouri: it is estimated that the damage done to buildings and culverts by the heavy rain-storm of the 6th will reach \$10,000. The Missouri Pacific Railroad track was washed out in several places between this place and Fort Scott, delaying trains for twenty-four hours. Crops were seriously damaged.

Dale Enterprise, Rockingham county, Virginia: the heavy rainfall of the month did great damage to county roads and railway tracks. Plowed fields were badly washed. The forks of the Shenandoah River were, on the 8th, as high as during the flood of November 24th, 1877.

Pittsburg, Pennsylvania: owing to heavy rainfall at the headwaters the Monongahela River rose nine feet in twenty-four hours on the 8th and 9th. A fleet of coal barges broke from its wharf and was carried down the river, detaching several other fleets with which it came in contact. Thirty-three barges were sunk or damaged, entailing a loss of about \$100,000.